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EXAMINER

BODDIE, WILLIAM

ART UNIT	PAPER NUMBER
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2629

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/757,584

Applicant(s)

ONO ET AL.

Examiner

William L. Boddie

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 29-55 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 29-55 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date ____ | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

1. In an amendment dated, June 27th, 2007, the Applicants cancelled claims 1-28 and added new claims 29-55. Currently claims 29-55 are pending.

Continued Examination Under 37 CFR 1.114

2. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on June 27th, 2007 has been entered.

Response to Arguments

3. Applicant's arguments with respect to claims 29 - 55 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 29 and 34 are rejected under 35 U.S.C. 102(b) as being anticipated by Eleyan et al (US 6,144,370).

With respect to claim 29, Eleyan discloses, a trackball device (fig. 13) comprising:

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a sphere (200 in fig. 13) including magnetic material (col. 8, lines 6-9);

a support configured to rotatably support said sphere (36, 94 in figs. 13-14);

a rotation detector configured to detect rotation of said sphere (94 in fig. 14) and output a signal indicating rotation of said sphere (dashed boxes in fig. 14; col. 1, lines 38-41; col. 5, lines 2-3);

a controller operably coupled to said rotation detector and being configured to generate a specific output signal responsive to a signal from said rotation detector indicating rotation of said sphere (col. 9, lines 49-58); and

an informer (106 in fig. 13-14) including an electromagnet (a-j in fig. 13);

wherein said sphere is disposed in a magnetic flux circuit generated by said electromagnet, and said informer is operable to change a friction force of said sphere with respect to said support by causing said electromagnet to generate a magnetic attractive force to influence said sphere (col. 8, lines 40-54) based on said specific output signal from said controller (col. 9, lines 56-57).

To further explain how Eleyan changes a friction force between the sphere and the supports, this limitation seems to be an outcome of any attractive forces generated by the device of Eleyan. First, to discuss the properties of friction. It is well-established physics that:

1) friction is created whenever two surfaces move or try to move across each other

2) the direction of the frictional force always opposes the motion or attempted motion of one surface across another surface, and

3) the magnitude of a frictional force is dependent upon the two things: the texture of the surfaces and the amount of force pushing the surfaces together.

In the case of Eleyan, as the electromagnets of Eleyan are used to rotate the sphere in two different directions this would, by definition, change the direction of the friction force. Therefore by definition it changes "a friction force of said sphere with respect to said support."

Additionally if electromagnet "a" applies a downward force on the sphere, this increases the force pushing the sphere and the supports together. Take for instance when electromagnet "a" in figure 13 is energized. The orientation of "a" is such that it will pull directly down on the sphere. This increases the force with which the sphere is pressing against the supports, and again, by definition, would 'change a friction force of said sphere with respect to said support.'

With respect to claim 34, Eleyan discloses, the trackball device of claim 29 (see above), wherein a direction of the magnetic flux generated by the electromagnet is alternately switched (col. 8, lines 36-44).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 30 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eleyan et al. (US 6,144,370) in view of Hallen et al. (US 6,518,890).

With respect to claim 30, Eleyan discloses, the trackball device of claim 29 (see above), wherein said support includes at least a first, second and third supporting member all of which are independent of the electromagnet (36 and each 94 in fig. 14).

Eleyan does not expressly disclose, wherein the electromagnet has a core with first and second ends, or furthermore wherein the first and second supporting members are coupled to the first and second end of said core, respectively.

Hallen discloses, a rotating disc (150 in fig. 1) including magnetic material (col. 3, lines 41-45);

a support configured to rotatably support said disc (170 in fig. 1);

an informer (115 in fig. 1) including an electromagnet having a core with first and second ends (left and right ends of 115 in fig. 1);

wherein said support includes at least a first supporting member (left arm of 170 in fig. 1) coupled to said first end of said core (left end of 115), and a second supporting member (right arm of 170 in fig. 1) coupled to said second end of said core (right end of 115).

Eleyan and Hallen are analogous art because they are both from the same field of endeavor namely electromagnetically actuated feedback devices.

At the time of the invention it would have been obvious to one of ordinary skill in the art to couple the first and second supporting members (94 in fig. 14, Eleyan) to an electromagnetic core as taught by Hallen.

The motivation for doing so would have been to simplify the manufacturing process as well as to lessen overall cost of the product by limiting the device to fewer electromagnets.

With respect to claim 33, Eleyan and Hallen disclose, the trackball device of claim 30 (see above).

Eleyan further discloses, wherein a direction of the magnetic flux generated by the electromagnet is alternately switched (col. 8, lines 36-44).

8. Claim 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over Eleyan et al. (US 6,144,370) in view of Hallen et al. (US 6,518,890) further in view of Yokoji et al. (US 6,909,422).

With respect to claim 31, Hallen and Eleyan disclose, the trackball device of claim 30 (see above).

Neither Hallen nor Eleyan disclose that the sphere and the supporting members are made from the same material.

Yokoji discloses, a trackball with a sphere (308 in fig. 19) and supporting members (326a, 325a in fig. 19) who are all formed from with an elastic surface material (col. 7, lines 60-65; col. 21, lines 42-46).

Yokoji, Hallen and Eleyan are all analogous art because they are all from the same field of endeavor namely, rotatable input/output devices.

At the time of the invention it would have been obvious to one of ordinary skill in the art to coat the surface of the sphere and support elements of Eleyan and Hallen with the with the same elastic material taught by Yokoji.

The motivation for doing so would have been to obtain an easy-to-manipulate track ball (Yokoji; col. 7, lines 63-65).

9. Claim 32 is rejected under 35 U.S.C. 103(a) as being unpatentable over Eleyan et al. (US 6,144,370) in view of Hallen et al. (US 6,518,890) further in view of Mailey et al. (US 5,237,311).

With respect to claim 32, Hallen and Eleyan disclose, the trackball device of claim 30 (see above).

Neither Hallen nor Eleyan disclose, a switch operated by depression of the sphere.

Mailey discloses, the inclusion of a switch (b in fig. 1), which is operated by depression of a sphere (10 in fig. 1) in relation with a third supporting member (42 in fig. 1; also note the abstract discussion of the transducer), wherein a controller is operable to detect a state of said switch (clear from fig. 1).

Mailey, Hallen and Eleyan are all analogous art because they are all from the same field of endeavor namely, rotatable input/output devices.

At the time of the invention it would have been obvious to one of ordinary skill in the art to replace the third supporting member of Eleyan and Hallen with the switch controlling support member taught by Mailey.

The motivation for doing so would have been, the elimination of awkward finger movements to actuate a switch (Mailey; col. 2, lines 5-9).

10. Claims 35 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eleyan et al. (US 6,144,370) in view of Mimlitch et al. (US 5,171,978).

With respect to claim 35, Eleyan discloses, the trackball device of claim 29 (see above).

Eleyan does not expressly disclose, wherein a permanent magnet configured to have a magnetic field that influences said sphere so as to force said support against said sphere.

Mimlitch discloses, a trackball device (fig. 1), wherein a permanent magnet (45 in fig. 1) is configured to have a magnetic field that influences a sphere (11 in fig. 1) so as to force a support (49 in fig. 1) against the sphere (col. 5, lines 58-60).

Mimlitch and Eleyan are analogous art because they are both from the same field of endeavor namely, trackball devices.

At the time of the invention it would have been obvious to one of ordinary skill in the art to include the permanent magnet of Mimlitch in the trackball device of Eleyan.

The motivation for doing so would have been to simplify manufacture and reduce wear of the device (Mimlitch; col. 1, lines 25-59) and ensure contact between the ball and the rollers.

With respect to claim 40, Eleyan and Mimlitch disclose, the trackball device of claim 35 (see above).

Eleyan further discloses, wherein said controller is operable to switch alternately a direction of the magnetic flux generated by the electromagnet (col. 8, lines 36-44).

11. Claim 36 is rejected under 35 U.S.C. 103(a) as being unpatentable over Eleyan et al. (US 6,144,370) in view of Mimlitch et al. (US 5,171,978) further in view of Tuovinen et al. (US 6,509,888).

With respect to claim 36, Eleyan and Mimlitch disclose, the trackball device of claim 35 (see above).

Neither Eleyan nor Mimlitch expressly disclose, that the permanent magnet is located so that a direction of magnetic lines generated by said permanent magnet coincides with a direction of magnetic lines generated by said electromagnet.

Tuovinen discloses, a roller input device (fig. 12b) wherein a permanent magnet (6 in fig. 1a) is located so that a direction of magnet lines (m in fig. 1a) generated by said permanent magnet coincide with a direction of magnetic lines generated by an electromagnet (41 in fig. 12b).

Tuovinen, Mimlitch and Eleyan are analogous art because they are both from the same field of endeavor namely, rotatable magnetic input devices.

At the time of the invention it would have been obvious to one of ordinary skill in the art to orient the permanent magnet of Mimlitch and Eleyan in the same direction as the electromagnet, as taught by Tuovinen.

The motivation for doing so would have been to not inadvertently counteract any feedback generated by said informer, thereby ensuring the maximum amount of feedback to the user possible.

12. Claim 37 is rejected under 35 U.S.C. 103(a) as being unpatentable over Eleyan et al. (US 6,144,370) in view of Mimlitch et al. (US 5,171,978) and further in view of Hallen et al. (US 6,518,890).

With respect to claim 37, Eleyan and Mimlitch disclose, the trackball device of claim 35 (see above).

Eleyan further discloses, wherein said support includes at least a first, second and third supporting member all of which are independent of the electromagnet (36 and each 94 in fig. 14).

Neither Eleyan nor Mimlitch expressly disclose, wherein the electromagnet has a core with first and second ends, or furthermore wherein the first and second supporting members are coupled to the first and second end of said core, respectively.

Hallen discloses, a rotating disc (150 in fig. 1) including magnetic material (col. 3, lines 41-45);

a support configured to rotatably support said disc (170 in fig. 1);

an informer (115 in fig. 1) including an electromagnet having a core with first and second ends (left and right ends of 115 in fig. 1);

wherein said support includes at least a first supporting member (left arm of 170 in fig. 1) coupled to said first end of said core (left end of 115), and a second supporting member (right arm of 170 in fig. 1) coupled to said second end of said core (right end of 115).

Eleyan, Mimlitch and Hallen are analogous art because they are both from the same field of endeavor namely electromagnetically actuated feedback devices.

At the time of the invention it would have been obvious to one of ordinary skill in the art to couple the first and second supporting members (94 in fig. 14, Eleyan) to an electromagnetic core as taught by Hallen.

The motivation for doing so would have been to simplify the manufacturing process as well as to lessen overall cost of the product by limiting the device to fewer electromagnets.

13. Claim 38 is rejected under 35 U.S.C. 103(a) as being unpatentable over Eleyan et al. (US 6,144,370) in view of Mimlitch et al. (US 5,171,978) and Hallen et al. (US 6,518,890) and further in view of Yokoji et al. (US 6,909,422).

With respect to claim 38, Hallen, Mimlitch and Eleyan disclose, the trackball device of claim 37 (see above).

Neither Hallen, Mimlitch nor Eleyan disclose that the sphere and the supporting members are made from the same material.

Yokoji discloses, a trackball with a sphere (308 in fig. 19) and supporting members (326a, 325a in fig. 19) who are all formed from with an elastic surface material (col. 7, lines 60-65; col. 21, lines 42-46).

Yokoji, Hallen, Mimlitch and Eleyan are all analogous art because they are all from the same field of endeavor namely, rotatable input/output devices.

At the time of the invention it would have been obvious to one of ordinary skill in the art to coat the surface of the sphere and support elements of Eleyan, Mimlitch and Hallen with the with the same elastic material taught by Yokoji.

The motivation for doing so would have been to obtain an easy-to-manipulate track ball (Yokoji; col. 7, lines 63-65).

14. Claim 39 is rejected under 35 U.S.C. 103(a) as being unpatentable over Eleyan et al. (US 6,144,370) in view of Mimlitch et al. (US 5,171,978) and Hallen et al. (US 6,518,890) and further in view of Bruneau et al. (US 2002/0054011).

With respect to claim 39, Eleyan, Mimlitch and Hallen disclose the trackball device of claim 37 (see above).

Neither Mimlitch, Hallen nor Eleyan expressly disclose, at least one switch disposed around said trackball device.

Bruneau discloses, an input device comprising:

a trackball device (fig. 2) comprising:

at least a first switch disposed around the trackball device (16a/b in fig. 1);

a sphere (15 in fig. 2);

a support for rotatably supporting the sphere (52,40 in fig. 2);

a rotation detector for detecting rotation of the sphere (54 in fig. 2);

a controller for generating a specific output signal responsive to a signal from the rotation detector (210 in fig. 5); and

an informer (148, 150, 18) for generating auxiliary information responsive to rotating of the sphere, the auxiliary information being based on the signal from the controller (para. 11).

Bruneau, Mimlitch, Hallen and Eleyan are analogous art because they are all from the same field of endeavor namely, electromagnetic feedback devices.

At the time of the invention it would have been obvious to one of ordinary skill in the art to include the switches, taught by Bruneau, around the trackball device of Eleyan, Mimlitch and Hallen.

The motivation for doing so would have been to allow the user to provide additional commands to a computer system (Bruneau; col. 4, lines 12-15).

15. Claim 41 is rejected under 35 U.S.C. 103(a) as being unpatentable over Eleyan et al. (US 6,144,370) in view of Bruneau et al. (US 2002/0054011).

With respect to claim 41, Eleyan discloses, an input device comprising,
a trackball device (fig. 13), and
a sphere (200 in fig. 13) including magnetic material (col. 8, lines 6-9);
a support configured to rotatably support said sphere (36, 94 in figs. 13-14);
a rotation detector configured to detect rotation of said sphere (94 in fig. 14) and
output a signal indicating rotation of said sphere (dashed boxes in fig. 14; col. 1, lines 38-41; col. 5, lines 2-3);

a controller operably coupled to said rotation detector and being configured to
generate a specific output signal responsive to a signal from said rotation detector
indicating rotation of said sphere (col. 9, lines 49-58); and

an informer (106 in fig. 13-14) including an electromagnet (a-j in fig. 13);
wherein said sphere is disposed in a magnetic flux circuit generated by said
electromagnet, and said informer is operable to change a friction force of said sphere
with respect to said support by causing said electromagnet to generate a magnetic

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attractive force to influence said sphere (col. 8, lines 40-54) based on said specific output signal from said controller (col. 9, lines 56-57):

Eleyan does not expressly disclose, at least one switch disposed around said trackball device.

Bruneau discloses, an input device comprising:

a trackball device (fig. 2) comprising:

at least a first switch disposed around the trackball device (16a/b in fig. 1);

a sphere (15 in fig. 2);

a support for rotatably supporting the sphere (52,40 in fig. 2);

a rotation detector for detecting rotation of the sphere (54 in fig. 2);

a controller for generating a specific output signal responsive to a signal from the rotation detector (210 in fig. 5); and

an informer (148, 150, 18) for generating auxiliary information responsive to rotating of the sphere, the auxiliary information being based on the signal from the controller (para. 11).

Bruneau and Eleyan are analogous art because they are all from the same field of endeavor namely, electromagnetic feedback devices.

At the time of the invention it would have been obvious to one of ordinary skill in the art to include the switches, taught by Bruneau, around the trackball device of Eleyan.

The motivation for doing so would have been to allow the user to provide additional commands to a computer system (Bruneau; col. 4, lines 12-15).

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16. Claim 42 is rejected under 35 U.S.C. 103(a) as being unpatentable over Eleyan et al. (US 6,144,370) in view of Bruneau et al. (US 2002/0054011) further in view of Hallen et al. (US 6,518,890).

With respect to claim 42, Eleyan and Bruneau disclose, the trackball device of claim 41 (see above).

Eleyan further discloses, wherein said support includes at least a first, second and third supporting member all of which are independent of the electromagnet (36 and each 94 in fig. 14).

Neither Eleyan nor Bruneau expressly disclose, wherein the electromagnet has a core with first and second ends, or furthermore wherein the first and second supporting members are coupled to the first and second end of said core, respectively.

Hallen discloses, a rotating disc (150 in fig. 1) including magnetic material (col. 3, lines 41-45);

a support configured to rotatably support said disc (170 in fig. 1);

an informer (115 in fig. 1) including an electromagnet having a core with first and second ends (left and right ends of 115 in fig. 1);

wherein said support includes at least a first supporting member (left arm of 170 in fig. 1) coupled to said first end of said core (left end of 115), and a second supporting member (right arm of 170 in fig. 1) coupled to said second end of said core (right end of 115).

Eleyan, Bruneau and Hallen are analogous art because they are both from the same field of endeavor namely electromagnetically actuated feedback devices.

At the time of the invention it would have been obvious to one of ordinary skill in the art to couple the first and second supporting members (94 in fig. 14, Eleyan) to an electromagnetic core as taught by Hallen.

The motivation for doing so would have been to simplify the manufacturing process as well as to lessen overall cost of the product by limiting the device to fewer electromagnets.

17. Claim 43 is rejected under 35 U.S.C. 103(a) as being unpatentable over Eleyan et al. (US 6,144,370) in view of Bruneau et al. (US 2002/0054011) further in view of Mimlitch et al. (US 5,171,978).

With respect to claim 43, Eleyan and Bruneau discloses, the trackball device of claim 41 (see above).

Neither Bruneau nor Eleyan expressly disclose, wherein a permanent magnet configured to have a magnetic field that influences said sphere so as to force said support against said sphere.

Mimlitch discloses, a trackball device (fig. 1), wherein a permanent magnet (45 in fig. 1) is configured to have a magnetic field that influences a sphere (11 in fig. 1) so as to force a support (49 in fig. 1) against the sphere (col. 5, lines 58-60).

Mimlitch, Bruneau and Eleyan are analogous art because they are both from the same field of endeavor namely, trackball devices.

At the time of the invention it would have been obvious to one of ordinary skill in the art to include the permanent magnet of Mimlitch in the trackball device of Eleyan and Bruneau.

The motivation for doing so would have been to simplify manufacture and reduce wear of the device (Mimlitch; col. 1, lines 25-59) and ensure contact between the ball and the rollers.

18. Claims 44 and 46-49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eleyan et al. (US 6,144,370) in view of Ideno (JP 64-24447).

With respect to claim 44, Eleyan discloses, a trackball device (fig. 13) comprising:

- a sphere (200 in fig. 13) including magnetic material (col. 8, lines 6-9);
- a support configured to rotatably support said sphere (36, 94 in figs. 13-14);
- a rotation detector configured to detect rotation of said sphere (94 in fig. 14) and output a signal indicating rotation of said sphere (dashed boxes in fig. 14; col. 1, lines 38-41; col. 5, lines 2-3);

- a controller operably coupled to said rotation detector and being configured to generate a specific output signal responsive to a signal from said rotation detector indicating rotation of said sphere (col. 9, lines 49-58); and

- an informer (106 in fig. 13-14) including an electromagnet (a-j in fig. 13);
- wherein said sphere is disposed in a magnetic flux circuit generated by said electromagnet, and said informer is operable to change a friction force of said sphere with respect to said support by causing said electromagnet to generate a magnetic attractive force to influence said sphere (col. 8, lines 40-54) based on said specific output signal from said controller (col. 9, lines 56-57).

Eleyan does not expressly disclose, providing a trackball device in a vehicle cabin.

Ideno discloses, a vehicle comprising:

a vehicle body having a vehicle cabin therein (fig. 1);

a drive wheel supporting the vehicle body (the inclusion of a drive wheel is inherent in the design of a vehicle); and

a trackball device provide in the vehicle cabin (2 in fig. 1).

Ideno and Eleyan are analogous art because they are both from the same field of endeavor namely the design and operation of rotatable input/output devices.

At the time of the invention it would have been obvious to one of ordinary skill in the art to use the trackball device of Eleyan in a vehicle as taught by Ideno.

The motivation for doing so would have been to enhance the interaction between drivers and the onboard computer system (Eleyan; col. 2, lines 50-53).

With respect to claim 46, Eleyan and Ideno disclose, the vehicle of claim 44 (see above).

Eleyan further discloses, a second controller (42 in fig. 2) configured to receive the signal from said first controller (clear from fig. 2); and

electronic equipment configured to be controlled by said second controller (46 in fig. 2).

With respect to claim 47, Eleyan and Ideno disclose, the vehicle of claim 44 (see above).

Eleyan further discloses, wherein said electronic equipment includes a display (46 in fig. 2) for displaying a cursor (44 in fig. 2), and rotation of said sphere causes movement of the cursor on the display (col. 4, lines 1-13).

With respect to claim 48, Eleyan and Ideno disclose, the vehicle of claim 44 (see above).

Ideno further discloses, wherein said trackball device is disposed in a central position of a full width of said vehicle cabin (clear from figs. 1 and 4).

With respect to claim 49, Eleyan and Ideno disclose, the vehicle of claim 44 (see above).

Ideno further discloses, two seats in a front portion of said vehicle cabin, wherein said trackball device is disposed between said two seats (once again this is clear from figs. 1 and 4).

19. Claim 45 is rejected under 35 U.S.C. 103(a) as being unpatentable over Eleyan et al. (US 6,144,370) in view of Ideno (JP 64-24447) and further in view of Hallen et al. (US 6,518,890).

With respect to claim 45, Eleyan and Ideno disclose, the vehicle of claim 44 (see above).

Eleyan further discloses, wherein said support includes at least a first, second and third supporting member all of which are independent of the electromagnet (36 and each 94 in fig. 14).

Neither Eleyan nor Ideno expressly disclose, wherein the electromagnet has a core with first and second ends, or furthermore wherein the first and second supporting members are coupled to the first and second end of said core, respectively.

Hallen discloses, a rotating disc (150 in fig. 1) including magnetic material (col. 3, lines 41-45);

a support configured to rotatably support said disc (170 in fig. 1);

an informer (115 in fig. 1) including an electromagnet having a core with first and second ends (left and right ends of 115 in fig. 1);

wherein said support includes at least a first supporting member (left arm of 170 in fig. 1) coupled to said first end of said core (left end of 115), and a second supporting member (right arm of 170 in fig. 1) coupled to said second end of said core (right end of 115).

Ideno, Eleyan and Hallen are analogous art because they are both from the same field of endeavor namely electromagnetically actuated feedback devices.

At the time of the invention it would have been obvious to one of ordinary skill in the art to couple the first and second supporting members (94 in fig. 14, Eleyan) of Eleyan and Ideno to an electromagnetic core as taught by Hallen.

The motivation for doing so would have been to simplify the manufacturing process as well as to lessen overall cost of the product by limiting the device to fewer electromagnets.

20. Claim 50 is rejected under 35 U.S.C. 103(a) as being unpatentable over Eleyan et al. (US 6,144,370) in view of Ideno (JP 64-24447) further in view of Mimlitch et al. (US 5,171,978).

With respect to claim 50, Eleyan and Ideno disclose, the vehicle of claim 44 (see above).

Neither Ideno nor Eleyan expressly disclose, wherein a permanent magnet configured to have a magnetic field that influences said sphere so as to force said support against said sphere.

Mimlitch discloses, a trackball device (fig. 1), wherein a permanent magnet (45 in fig. 1) is configured to have a magnetic field that influences a sphere (11 in fig. 1) so as to force a support (49 in fig. 1) against the sphere (col. 5, lines 58-60).

Mimlitch, Ideno and Eleyan are analogous art because they are both from the same field of endeavor namely, trackball devices.

At the time of the invention it would have been obvious to one of ordinary skill in the art to include the permanent magnet of Mimlitch in the trackball device of Eleyan and Ideno.

The motivation for doing so would have been to simplify manufacture and reduce wear of the device (Mimlitch; col. 1, lines 25-59) and ensure contact between the ball and the rollers.

21. Claims 51-53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eleyan et al. (US 6,144,370) in view of Mimlitch et al. (US 5,171,978) further in view of Ideno (JP 64-24447).

With respect to claim 51, Eleyan, Mimlitch and Ideno disclose, the vehicle of claim 50 (see above).

Eleyan further discloses, a second controller (42 in fig. 2) configured to receive the signal from said first controller (clear from fig. 2); and

electronic equipment configured to be controlled by said second controller (46 in fig. 2).

With respect to claim 52, Eleyan, Mimlitch and Ideno disclose, the vehicle of claim 50 (see above).

Eleyan further discloses, wherein said electronic equipment includes a display (46 in fig. 2) for displaying a cursor (44 in fig. 2), and rotation of said sphere causes movement of the cursor on the display (col. 4, lines 1-13).

With respect to claim 53, Eleyan, Mimlitch and Ideno disclose, the vehicle of claim 50 (see above).

Ideno further discloses, wherein said trackball device is disposed in a central position of a full width of said vehicle cabin (clear from figs. 1 and 4).

With respect to claim 54, Eleyan, Mimlitch and Ideno disclose, the vehicle of claim 50 (see above).

Ideno further discloses, two seats in a front portion of said vehicle cabin, wherein said trackball device is disposed between said two seats (once again this is clear from figs. 1 and 4).

22. Claim 55 is rejected under 35 U.S.C. 103(a) as being unpatentable over Eleyan et al. (US 6,144,370) in view of Susumu (JP 2000-226641).

With respect to claim 55, Eleyan discloses, a trackball device (fig. 13) comprising:

- a sphere (200 in fig. 13) including magnetic material (col. 8, lines 6-9);
- a support configured to rotatably support said sphere (108, 36, 94 in figs. 13-14);
- a rotation detector configured to detect rotation of said sphere (94 in fig. 14);
- a controller configured to generate a specific output signal responsive to a signal from said rotation detector (col. 9, lines 49-55); and
- an informer (106 in fig. 13-14) including electromagnet (a-j in fig. 13), and being configured to generate auxiliary information responsive to rotating of said sphere, the auxiliary information being based on the signal from said controller (col. 9, lines 49-58);

wherein said sphere is disposed in a magnetic flux circuit generated by said electromagnet, and said informer is operable to generate the auxiliary information by causing said electromagnet to generate a magnetic attractive force to influence said sphere (col. 8, lines 40-54).

Eleyan does not expressly disclose, that the sphere is formed of one of martensite stainless steel and ferrite stainless steel.

Susumu discloses, forming small spheres out of martensite stainless steel (solution).

Susumu and Eleyan are analogous art because they are both from the same field of endeavor namely the design and manufacturing small metallic spheres.

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At the time of the invention it would have been obvious to one of ordinary skill in the art to construct the sphere of Eleyan out of martensite stainless steel as taught by Susumu.

The motivation for doing so would have been for the well-known corrosion resistance properties of martensitic stainless steel (Susumu; problem to be solved).

Conclusion

23. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Furuki et al. (US 6,354,945) discloses, a controller, which comprises an electromagnet located over a metal sphere. Especially pertinent are figures 4-5 which disclose the manner of the operation of the controller. Also pertinent is Muresane et al. (US 7,015,895) which discloses magnetically pulling the mouse ball into to rollers. Specifically note figure 2.

24. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Will L. Boddie whose telephone number is (571) 272-0666. The examiner can normally be reached on Monday through Friday, 7:30 - 4:30 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sumati Lefkowitz can be reached on (571) 272-3638. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Wlb
8/30/07



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